

Nidification of Dwarf Whistler *Pachycare flavogriseum*, a little-known New Guinea endemic

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The Dwarf Whistler or Goldenface *Pachycare flavogriseum* is a distinctive monotypic genus confined to hill and montane forests at 400–1,800 m on New Guinea (Coates 1990). *Pachycare* is the smallest of the Pachycephalidae with distinctive coloration, and its position in the family is uncertain (Coates 1990). Sibley & Monroe (1990) stated that it might be related to the Australian robins (*Petroica*, *Eopsaltria*). Four subspecies are generally recognised, *flavogriseum*, *subaurantium*, *subpallidum* and *randi*, distinguished mostly by the relative brightness of their plumage, a character that varies with specimen age (Rand & Gilliard 1968). Modern phylogenetic analyses, using either morphological or molecular data, that could clarify the affinities of this distinctive genus have not been undertaken, despite some research on the Pachycephalidae (Sibley & Ahlquist 1982, Dumbacher & Fleischer 2001). Furthermore, little is known of *Pachycare* natural history, providing additional few clues to its systematics.

Breeding data are available only for race *subpallidum*. The nest is poorly known, described only briefly from one sent to Lord Rothschild from the Rawlinson Mountains, in the eastern Huon Peninsula (Rothschild & Hartert 1913). It was noted as ‘a large structure of fibres and decayed leaves, wrapped up in fresh leaves. Its original shape is uncertain, but it seems to be a cave about 10 cm deep, narrowing below; the entrance has apparently been at the top.’ This appears to be the only published description of the nest.

The eggs were also briefly described. Those sent to Rothschild were ‘whitish-pink...covered all over with rufous pink spots and patches’ and measured $c.21 \times 15$ mm (Rothschild & Hartert 1913). A different set of two in the British Museum (Natural History), reported as from the Rawlinson Mountains, were glossy and pinkish in ground colour, but almost entirely obscured by dense markings consisting of fine blotches, spots and smears of russet, maroon and purple (Frith 1971); they measured 21.0×15.0 and 20.5×15.0 mm. There were no nest notes associated with this clutch.

Observations

Here we report recent observations of nests and eggs in the Crater Mountain Wildlife Management Area, Eastern Highlands province, Papua New Guinea. One nest (nest 1) was observed near the village of Herowana ($06^{\circ}39'S$, $145^{\circ}11'E$), at $c.1,400$ m, on 29 November 2004. A further nest (nest 2) was observed at Crater Mountain Biological Research Station (CMBRS) ($06^{\circ}43'S$, $145^{\circ}05'E$) at $c.1,100$ m,

on 14 June 2004. Vegetation is typical of the mid-elevation high rainfall zone (Hyndman & Menzies 1990) along the southern scarp of the central cordillera (Wright *et al.* 1997), and the avifauna is well documented (Mack & Wright 1996). The wide spread in breeding dates is not unusual in the Crater Mountains (unpubl. data). At both nests attendant *Pachycare flavogriseum* were positively identified at close range. Sitting birds remained on the nest and only flushed when an observer approached within 2 m. When discovered, nest 1 had two chicks that appeared to be c.2 days old. Upon revisiting the nest one week later the chicks were absent and the adults not in evidence. The nest was dismantled carefully to examine its construction. Nest 2 was revisited several times in early July when no adults were evident and one cold egg was removed on 13 July.

Nest 2 was almost complete when discovered. A male and female *Pachycare* were observed bringing nest material to nest 2, on 14–19 June. They approached the nest together, perching on low branches c.30–150 cm above ground. The final leap to the nest entrance was made from a small branch 2–3 m from the entrance and 40 cm above ground. When carrying nest material, the male invariably entered the cavity first. Typically, the female perched on the low branch mentioned above until the male left, entering the nest 10–20 seconds later. Both spent roughly equal time inside the nest, ranging 8–84 seconds. The male perched in a nearby tree until the female emerged from the cavity, and they departed together. During the period of intensive building activity both returned after 2–5 minutes with new material. That carried inside the cavity consisted of dry moss, lichen and plant filaments or grass. Contact calls between the pair in the vicinity of the nest were very distinctive. Both sexes uttered a muted, high-pitched twittering and some low-volume trills. During observations on 19 June at nest 2 building activity was much reduced. Only the female entered the cavity, twice for more than 60 seconds, with visits 15 minutes apart. The male stayed with the female when approaching the nest and waited for her to exit. The male did not carry any material and did not enter the cavity.

The egg found was subelliptical, 22.3 × 16.5 mm and weighed 3.2 g. It was glossy at the narrow end, but matt at the blunt end. The base colour was rose white with the rose tone slightly stronger at the middle and paler near both ends. Very small (<0.3mm) speckles and blotches were sparsely scattered over the entire egg except the smaller tip. A distinct corona of many small and several larger (1-mm) blotches formed an almost continuous band c.4.5 mm wide at the broader end. Splotches were darker than the background and were dark greyish to rusty rufous-brown.

Both nests were on the ground against the downhill base of a sapling or small tree on a slope. It is a domed globe, c.15–18 cm in external diameter, formed of three separate components: the foundation, nest dome, and cap. The base foundation is a mat of twigs in a shallow depression. The twigs are straight, dry but not rotten, with somewhat larger twigs against the ground, up to 160 mm long by 4 mm diameter. On these is a thicker layer of smaller twigs up to 105 mm by 3.8 mm diameter. On this platform is constructed a globe that lifts neatly off the foundation,

i.e. the twigs of the platform are not incorporated into the nest dome. The globe is a moderately tight intertwined ball of fairly decayed monocot leaf strips, probably mostly bamboos and other grasses. The strips appear to have been already decayed when used, giving the mass the appearance of decomposing leaf litter. The entrance faced downhill and has a small 'vestibule'. The inside of the globe is woven more tightly with finer strips of monocot leaves or other plant fibres.

The cap comprises less rotten, but dead and decomposing leaves, laid loosely over the dome in a dense layer that seems to keep the interior quite dry. Some of these leaves were placed to droop slightly over the mouth of the entrance, casting a deep shadow over the entry, making it necessary to crouch close to the ground in order to view into the nest. Overall, the nest looked like an accumulation of leaf litter as typically piles up at the base of a sapling or small tree, with leaves on top covering a layer of more decayed vegetation. The effect was such that even from 2 m it was extremely well camouflaged and hard to distinguish as a nest.

Discussion

This nest is strikingly different from all other known Pachycephalid nests, which typically build cup or platform nests above the ground. Indeed, the structure of the observed *Pachycare* nest is unlike almost all nests of birds in the region. Nor does the nest resemble those of *Petroica* or *Eopsaltria* (Higgins & Peter 2002), two genera of which *Pachycare* has been speculated to be an ally (Sibley & Monroe 1990). Interestingly, the nest bears a close resemblance to those described for *Orthonyx temminckii* in Papua New Guinea (Coates 1990) (= *O. novaeguineae*, see Joseph *et al.* 2001) and *O. temminckii* in Australia (North 1904, Boles 1988, Higgins & Peter 2002), and is fairly similar to that of *O. spaldingii* (Frith *et al.* 1997, Higgins & Peter 2002). The resemblance of *O. temminckii* and lyrebird nests (*Menura* spp.) has also been noted (Higgins & Peter 2002); thus *Pachycare* also resembles a scaled-down lyrebird nest in that it is a globular domed nest with a side entrance on the ground atop a platform of twigs. Nest architecture can be a useful character in reconstructing phylogenies (Sheldon & Winkler 1999, Zyskowski & Prum 1999).

Because the Pachycephalidae is a fairly heterogeneous mix of taxa, there are few characters that can definitively delineate the family. Pachycephalid bill form varies from *Eulacestoma* with its odd, laterally compressed bill to *Colluricincla* with a strong hooked bill, whereas *Pachycare* has a slenderer bill than the other genera in the family. *Pachycare* is not that radically different from other taxa, with a loud melodious song, weak sexual dimorphism, insectivorous habits, and a distinctive facial pattern. The skull is somewhat slimmer than *Pachycephala* and *Pachycare* is generally more active and energetic than many of the other whistlers. These differences are minor, but have led to some speculation about if and where *Pachycare* belongs in the family (Coates 1990). We suggest the exceptionally different *Pachycare* nest from other Pachycephalids indicates that the genus represents either a distinct lineage outside Pachycephalidae or that it is a sister group to the other Pachycephalids. We suspect it is unlikely that such a distinctive nest is

an autapomorphy of a lineage the Pachycephalid clade having relatively homogenous nest architecture.

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